

ASSESSMENT RESULTS

The total quantity of technically recoverable oil within the entire assessment area is estimated to be between 5.7 and 16.0 billion barrels (95-percent and 5-percent probability range), with a mean value of 10.4 billion barrels. Technically recoverable oil within the ANWR 1002 area (excluding State and Native areas) is estimated to be between 4.3 and 11.8 billion barrels (95- and 5-percent probability range), with a mean value of 7.7 billion barrels (table 1).

Quantities of technically recoverable oil are not expected to be uniformly distributed throughout the ANWR 1002 area. The undeformed area (fig. 2) is estimated to contain between 3.4 and 10.2 billion barrels of oil (BBO) (95- and 5-percent probability), with a mean of 6.4 BBO. The deformed area (fig. 2) is estimated to contain between 0 and 3.2 BBO (95- and 5-percent probability), with a mean of 1.2 BBO.

Figure 5 shows the expected numbers of accumulations and volumes of technically recoverable oil grouped by accumulation-size class. It shows that most of the oil is estimated to occur in accumulations that exceed 100 million barrels, the size of recently developed north Alaskan stand-alone accumulations. Moreover, at the mean, nearly 80 percent of the oil is thought to occur in the western part of the ANWR 1002 area, which is closest to existing infrastructure. Volumes of oil are expected to occur as several accumulations rather than a single large accumulation.

Commercial viability of a discovery depends on oil price, accumulation size, recovery technology, and proximity to existing infrastructure (pipelines, etc.). The economic analysis presents the cost of transforming technically recoverable resources into producible proved reserves—it shows the market price that would have to be paid to find, develop, produce, and transport to market (lower 48 West Coast) any particular quantity of assessed oil assuming current technology and existing scientific understanding. Figure 6, which is based on the field-size distributions associated with the mean, 95-, and 5-percent probability oil estimates, summarizes the findings of the economic analysis. The cost functions are calculated in constant 1996 dollars and are based on the expectation that production will repay all operating costs, including taxes and transport to market, all investment expenditures, and provide an after-tax rate of return of at least 12 percent on the investment.

*In-place resources.—The amount of petroleum contained in accumulations of at least 50 MMBO without regard to recoverability.*  
*Technically recoverable resources.—Volume of petroleum representing that proportion of assessed in-place resources that may be recoverable using current recovery technology without regard to cost.*  
*Economically recoverable resources.—That part of the technically recoverable resource for which the costs of discovery, development, and production, including a return to capital, can be recovered at a given well-head price.*

Table 1. Estimates of volumes of technically recoverable oil in various parts of the ANWR assessment study area.

[ANWR, Arctic National Wildlife Refuge. All reported oil volumes in millions of barrels. Basic statistical principles determine that mean values can be added and subtracted but F<sub>95</sub> and F<sub>05</sub> values cannot (e.g., means for the undeformed and deformed parts of the ANWR 1002 area sum to the mean for the total ANWR 1002 area, but F<sub>95</sub> and F<sub>05</sub> values do not). F<sub>95</sub>, 95-percent probability level; F<sub>05</sub>, 5-percent probability level]

Part of study area	Volume of oil, in millions of barrels		
	F <sub>95</sub>	Mean	F <sub>05</sub>
Entire assessment area <sup>1</sup>	5,724	10,360	15,955
ANWR 1002 area (Federal), TOTAL	4,254	7,668	11,799
Undeformed part	3,403	6,420	10,224
Deformed part	0	1,248	3,185

<sup>1</sup> Includes 1002 area shown on figure 2, Native lands, and adjacent State water areas within 3-mile boundary (see fig. 2).

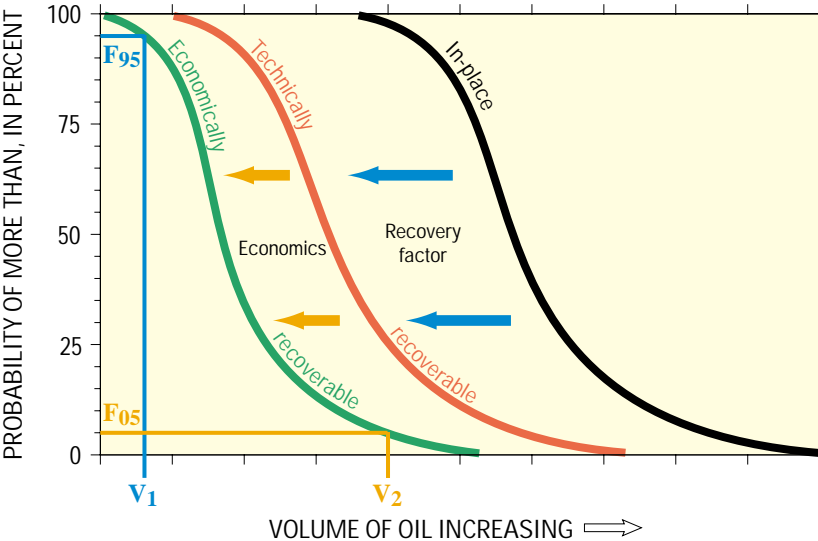
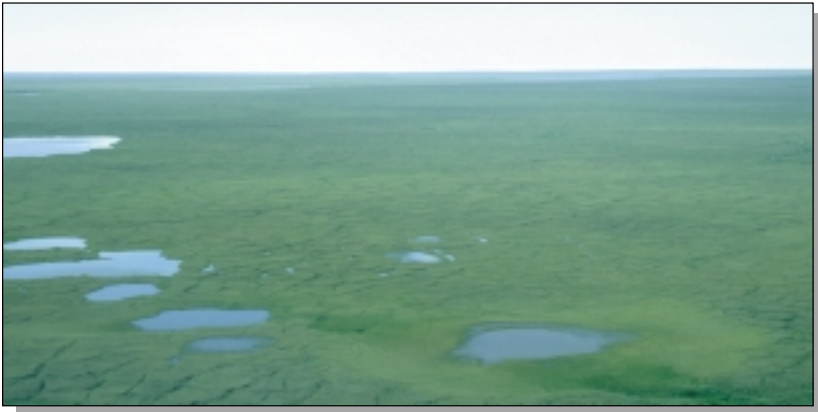


Figure 4. Schematic graph illustrating petroleum volumes and probabilities. Curves represent categories of oil in assessment. An example of how one reads this graph is illustrated by the blue and orange lines projected to the curve for economically recoverable oil. There is a 95-percent chance (i.e., probability, F<sub>95</sub>) of at least volume V<sub>1</sub> of economically recoverable oil, and there is a 5-percent chance (F<sub>05</sub>) of at least volume V<sub>2</sub> of economically recoverable oil.



Typical view of the ANWR 1002 area coastal plain.